



**HEAVY TRANSPORT AND LIFTING**

***Worldwide Heavy Transportation & Lifting***

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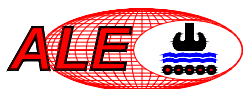
## **COMPANY PROFILE**

### **ALE LASTRA B.V.**

Eikdonk 13a  
4825 AZ Breda  
The Netherlands

Tel: +31 (0) 76 571 5240  
Fax: +31 (0) 76 587 5084

E.mail: [info@ale-lastra.nl](mailto:info@ale-lastra.nl)  
[www.ale-heavylift.com](http://www.ale-heavylift.com)



## ABNORMAL LOAD ENGINEERING CONTACT INFORMATION

## INTRODUCTION

## EQUIPMENT AND SERVICES

- Heavy Transportation
- Self Propelled Trailers
- Self Propelled Modular Transporters
- Heavy Skidding
- Tower Lifting and Gantries
- Heavy Cranage
  
- Load-out
- Project Management
- Engineering and Technical
- Marine/Barging/Seafastening

## WORK EXPERIENCE

- Project Specific
- Selection of UK Contracts
- Selection of Overseas Contracts
- Selection of Middle East Contracts

## HEALTH, SAFETY & ENVIRONMENT

## QUALITY MANAGEMENT SYSTEM

# ALE CONTACT INFORMATION

***Strategic Worldwide Operations, Engineering and Sales Office's*****ALE Heavylift – Global Projects  
(Heavy and Project Cranage)*****Europe***

Abnormal Load Engineering Ltd- Hixon, UK  
Abnormal Load Engineering Ltd – Middlesbrough, UK  
ALE Lastra B.V. – The Netherlands  
ALE Lastra S.A. – Spain  
Econofreight – Norway

***North America***

ALE Heavylift L.P. – Houston – Texas – USA

***South America***

ALE Lastra S.A. – Spain

***South Africa***

ALE Lastra B.V. – The Netherlands

***Middle East***

ALE Middle East LLC – United Arab Emirates

***Far East and Australasia***

ALE Heavylift (M) Sdn. Bhd. – Malaysia  
ALE Heavylift Taiwan Ltd - Taiwan

**Abnormal Load Engineering Limited****ALE Heavylift Limited**

New Road Hixon,  
Staffordshire ST18 OPE  
United Kingdom

Tel: +44 (0) 1889 272500 Fax: + 44 (0) 1889 271750

**Abnormal Load Engineering Limited**

Billingham Reach Industrial Estate  
Billingham TS23 1PX  
United Kingdom

Tel: +44 (0) 1642 373800 Fax: +44 (0) 1642 373839

**ALE Lastra S.A.**

C/San Romualdo, 26-6<sup>th</sup> planta  
28037 Madrid  
Spain

Tel: +34 (0) 91 375 7160 Fax: +34 (0) 91 304 4426

**ALE Lastra B.V.**

Eikdonk 13a  
4825 AZ Breda  
The Netherlands

Tel: + 31 (0) 76 571 5240 Fax: +31 (0) 76 587 5084

**ALE Middle East LLC**

P.O. Box 52875  
Abu Dhabi

United Arab Emirates

Tel: +971 (0) 2676 9504 Fax: +971 (0) 2676 7603

**ALE Heavylift (M) Sdn.Bhd.**

3-3 Jalan 26/70A  
Desa Sri Hartamas

50480 Kuala Lumpur – Malaysia

Tel: +60 (0) 32300 1474 Fax: +60 (0) 32300 1508

**ALE Heavylift Taiwan Limited**

A6 19F No. 25 Chung Zen Road  
Nan Kan – Taoyan County  
Taiwan ROC

Tel: +886 (0) 3352 6053 Fax: +886 (0) 3352 6133

**ALE Heavylift LP**

4935 Timber Creek Drive  
Houston Texas 77017  
U.S.A.

Tel: +1 (0) 713 946 3125 Fax: +1(0) 713 378 5485

***www.ale-heavylift.com***  
***E.Mail: info@ale-lastra.nl***

# INTRODUCTION

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**Abnormal Load Engineering Limited (ALE)** was formed in 1983 to provide an engineering service to manufacturers of electrical plant and utility companies associated with the movement and installation of large items of generating plant.

Subsequently the company has developed into one of the world's major international heavy transport and installation contractors working for all industrial sectors with a considerable fleet of modern heavy cranes, specialist transport and installation equipment.

The development of the company has been enabled through demand from clients requiring an experienced heavy lift and transportation contractor capable of undertaking major projects worldwide.

In 1992 Abnormal Load Engineering set up as a full scale operation in Abu Dhabi, servicing the Oil, Gas and Power industries in the UAE, and has since expanded to carry out major projects (included some of the worlds largest desalination plants) throughout the entire Middle East and North Africa.

This was followed by opening of offices and operating centres in North America (Houston), South America (Venezuela) and the Far East (Taiwan and Thailand).



In 2002 Abnormal Load Engineering acquired the Brambles Heavy Contracting Group. This business includes (Econofreight with branches in the UK, USA and Malaysia) and Lastra (with branches in the Netherlands and Spain). The extra resources of proven, skilled and experienced personnel and additional transport and installation equipment ensures that ALE is equipped to bid and perform the very largest and most demanding heavy lift contracts worldwide.

The corporate headquarters is situated in Hixon, Staffordshire in the UK and is a large operating centre focused on worldwide heavy lifting work, heavy power generation and petrochemical plant.

The International Project Division is also based at Hixon and is responsible for securing and project managing the successful performance of major 'turnkey' projects. It is staffed with experienced project personnel and is able to support clients at an early stage in a project's development with conceptual and feasibility studies and technical advice.

The Teesside branch is focused on offshore and load-out, civil engineering and steel structures, and securing major contracts in Scandinavia.

To complement our large resource of heavy transport equipment and lifting systems we have invested in heavy lift crange. This fleet includes crawler and truck mounted machines up to 1500 tonnes capacity.

Our management team, rigging and transport engineers and skilled work force have considerable experience and technical knowledge covering all aspects of abnormal load transport and handling on land and sea.

Abnormal Load Engineering has the necessary project management and technical skills to offer clients a comprehensive, turnkey operation including shipping, barging, crange, transport, on-site handling and installation.

# INTRODUCTION

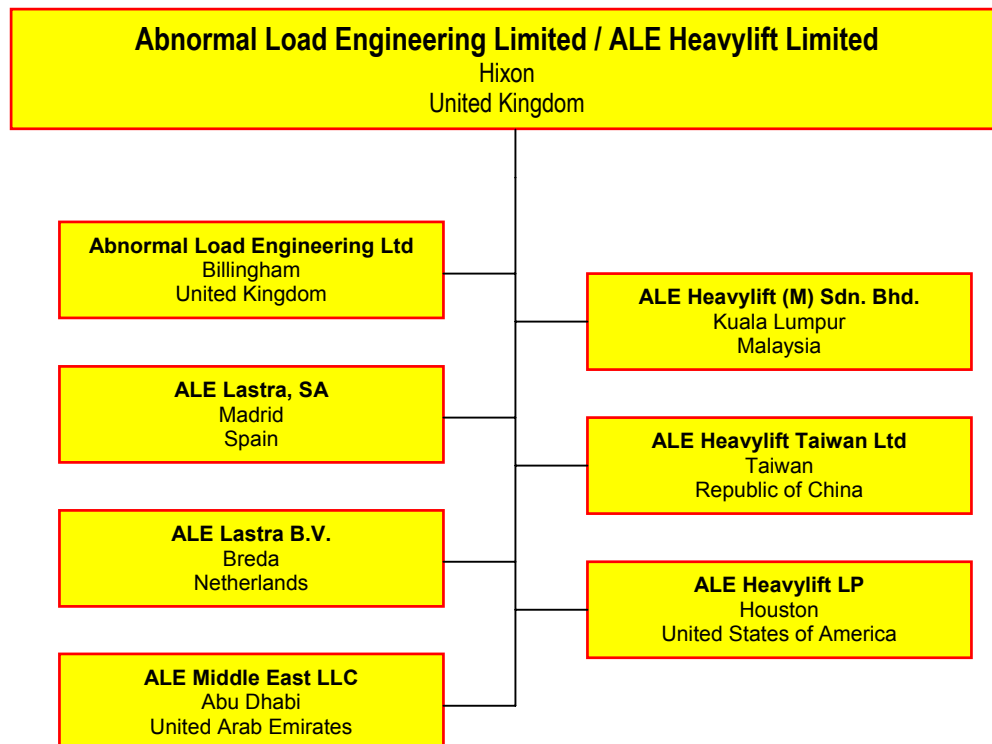
The company operates a modern Health, Safety and Environment system and is strongly committed to maintaining this.

The company achieved ISO:9002 certification in 1994 and is registered on the Norwegian Achilles system.

## THE COMBINED RESOURCES OF THE GROUP INCLUDES:-

- ☐ Worldwide Operations, Engineering and Sales Offices
- ☐ Over 1,000 axles of latest generation Self Propelled and Conventional Modular Trailers, over 20,000 tonnes capacity
- ☐ Project Cranage Fleet up to 1,500 tonnes capacity
- ☐ Skidding Equipment in excess of 25,000 tonnes capacity
- ☐ Heavy Lifting Gantries and Strand Jack Systems, over 12,000 tonnes capacity
- ☐ Major Project Management Teams
- ☐ Heavy Lifting, Transportation and Design Engineers
- ☐ Naval Architects for Marine Operations

## GLOBAL COMPANY STRUCTURE:-

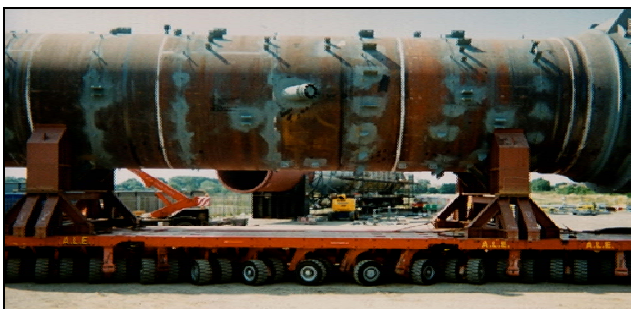


# EQUIPMENT & SERVICES



Abnormal Load Engineering operates one of the worlds largest fleets of heavy transportation axles and ancillary equipment.

Around 1,000 axles of self propelled and conventional modular axles are strategically located worldwide, increasing flexibility, maximising availability and reducing mobilisation and shipping costs.



## ❑ **Transport Reactor @ 460T using 32 Axles SPMT's**

ALE also operate a fleet of some 40 No. semi trailers, both step frame and low loader trailers, for transportation of general and over dimensional cargo, and also mobilisation of heavy transport and lifting equipment.

The trailer fleet is operated by a team of experienced, trained personnel and is maintained to the highest standards.



## ❑ **Transport Rotor on Conventional Trailer**

The fleet consists of:-

### **Self Propelled Modular Transporters**

- around 400 axles of the latest generation, hydraulic suspension, 360° steering, computerised, self driven modular axles.

### **Self Propelled Transporters**

- around 300 axles of hydraulic suspension, 45/55° steering, self driven modular axles.

### **Conventional Modular Axles**

- around 300 axles of hydraulic suspension, 45° steering, conventional modular axles, propelled by heavy duty prime movers.

The conventional modular axles are available in varying widths of 2.75m, 3.0m, 3.65m, 4.2m, 4.8m and 6.2m and are readily adaptable in 2-file, 3-file and 4-file combinations to meet the requirements of the cargo, transport route and local conditions/regulations.



## ❑ **Transport of Piperack using SPT**



In addition the fleet is supplemented by a large range of ancillary equipment including:-

- **30 No. Heavy Duty tractor Units**
  - to 300 tonnes capacity
- **Transporter Frame Trailers**
  - for movement of electrical plant
  - 6 No. frames enabling 15 different configurations to 32 axles and 400 tonnes capacity
- **Load Carrying Bolsters**
  - 8 No. sets up to 1,500 tonnes capacity
- **Tailing Frames**
  - up to 1,500 tonnes capacity
- **Support Stools and Transport Beams**
  - high capacity heavy duty
  - over 600 No. stools and 200 No. transport beams
- **Load Spreading Mats**
  - over 200 No. of various size steel mats
- **Temporary Bridging Mats and Support Props**
  - high capacity heavy duty equipment of various sizes
- **Installation and jacking equipment**
  - hydraulic jacks, climbing jacks, hard timbers, skates/rollers, winches, tirsors, installation vehicles with 'hiab' cranes, low level skid systems



❑ **Support Trestle Arrangement**



❑ **Double Bolster Arrangement**

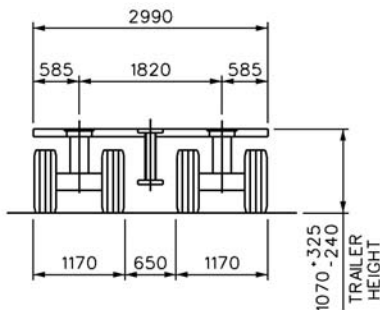


❑ **Transportation using Transporter Frame Trailer**

ALE has developed self-propelled trailers (SPT) units with integrally mounted power packs.

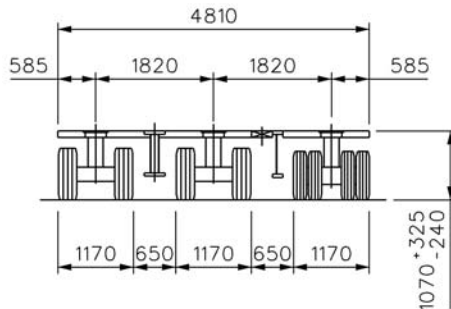
Drive axle units can be operated independently or assembled into any combination. The units overcome the need for ballasted heavy duty prime movers, which improves manoeuvrability and flexibility of use.

Optimum applications include the on-site movement of bridge units, pre-assembled piperacks and structures requiring adaptable support conditions, but not the high carrying capacity of Self Propelled Modular Transporters (SPMT's)



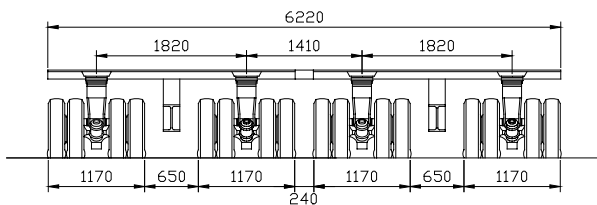
### 2 - File Unit

Carrying Capacity = 24.5 Te/Axle



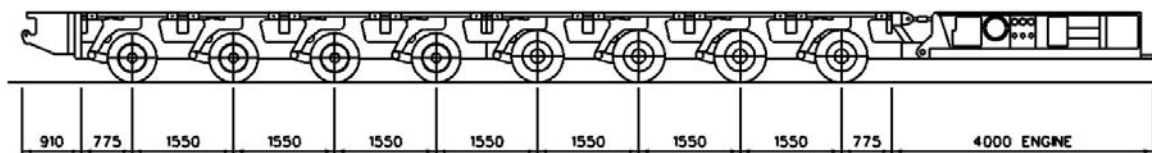
### 3 - File Unit

Carrying Capacity = 36.8 Te/Axle



### 4 - File Unit

Carrying Capacity = 49 Te/Axle



### Side Elevation

Trailer configurations made up using multiples of 2, 3, 4, 5 & 6 axle standard modules



### Self-Propelled Trailer

Key features include:

- 45 to 55 degree steering.
- Fully self powered for movement in any direction.
- Multi-axle, high torque, drive units to maximise tractive effort.
- 2, 3, 4, 5, 6 or 8 axles driven using multi speed drive ratio.
- Multiple platform width options
- Multiple power modules capable of being inter linked and readily replaceable.
- Remote or local control options.
- 3 or 4 point hydraulic suspension capabilities.



The development of self propelled modular transporters (SPMT's) is a major advance in the technology of moving very large loads.

This new generation of heavy transport equipment combines state of the art design with proven components. The 4 and 6 axle line transporter units can be operated independently or assembled into any combination.

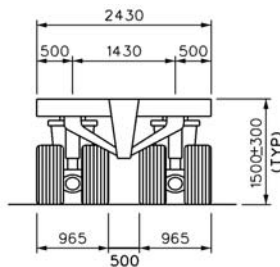
Individual transporters can be hydraulically and electronically linked to provide a support platform matched to the characteristics of the load and the route.

Programmable, 360 degree electronic steering achieves extremely accurate load positioning even under arduous site conditions.

The SPMT transport system is an unrivalled method for the safe and effective transport of the largest loads.

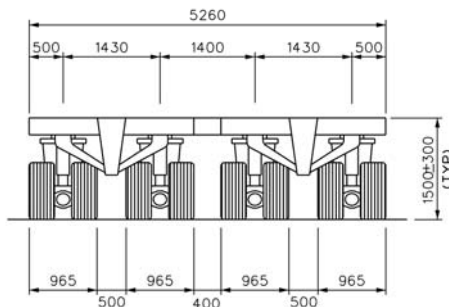
### Examples of Typical End Elevations:

Combinations may be joined side by side



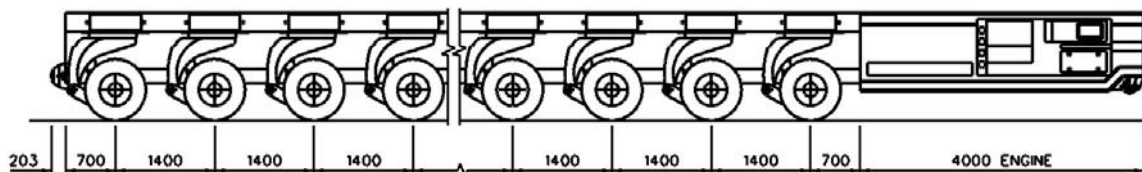
**2 - File Unit**

Carrying Capacity = 32Te/Axle



**4 - File Unit**

Carrying Capacity = 64Te/Axle



**Side Elevation**

Trailer configurations made up using multiples of 2, 3, 4, 5 & 6 axle standard modules



### Self Propelled Modular Transporter

Key features of the SPMT system include:

- 360 degree electronic steering.
- Hydraulically driven for movement in any direction.
- Multi-axle, high torque drive units, maximising the tractive effort.
- 25 or 50 per cent of all axles driven.
- Multi power modules capable of being inter linked.
- Advanced coupling systems to reduce rigging time.
- In cab or remote control option.
- Single point control for multi transporter operation.
- 3, 4 or multi suspension capability.

ALE was the first company to design, develop and operate the hydraulic compensated skidshoe systems. The skid systems are designed for the safe, precise horizontal movements, which provide a means of moving plant and structures in confined or restricted environments. The movement/load-out equipment is a skidding system in which hydraulic skidshoes with stainless steel bases move over P.T.F.E. blocks, which are laid into steel skidtracks.

The skid system is designed as a skidshoe incorporating a cylinder, on top of this cylinder a pivot arrangement.

Configurations can be made up whereby the same hydraulic pressure in the system gives different individual jacking forces. This is achieved by interconnecting the bottom and top of the jack and varying the diameter of the bottom guiding rod. The motive force required for moving the structure is generated by hydraulic push-pull cylinders, which are an integrated part of the skidway system.

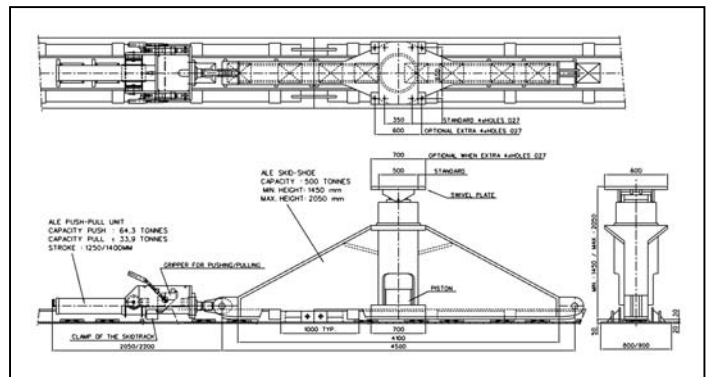
We can operate the following capacity skidshoe systems:-

- 25 tonnes capacity skidshoes
- 50 tonnes capacity skidshoes
- 500 tonnes capacity skidshoes
- 1,000 tonnes capacity skidshoes

Total in-house skidding capacity of approx. 42,000 metric tonnes.



❑ **Reactor in congested area utilising high level skid track**



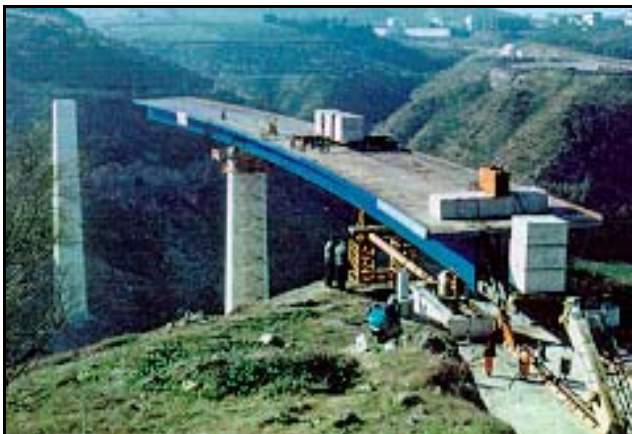
The movement is intermittent, following an extend, retract sequence of the cylinders. The units can be operated simultaneously or individually, as may be required. The units are directly coupled to the skidshoes by means of a pin-connection. Centralised diesel-driven powerpacks generate the hydraulic power required for operation of the hydraulic cylinders of the skidshoes and the push-pull units.

The skidshoes can accommodate side forces up to 10% of the vertical load. For skidding, the hydraulic cylinders within the skidshoes can be connected into separate hydraulic groups to enable a 3 point or if desired, a multi point hydraulic suspension. Furthermore within the 500 tonnes capacity skidshoe system, there are incorporated cylinders with different plunger diameters, which can be configured in such a way that all cylinders within a hydraulic group will impose the same reaction into the supported structure.

It is also possible to install separate stroke transducers to control the individual stroke of each cylinder and to control and operate each jack individually.

The ALE Lastra skidshoe creates a unique system for the movement of high pointloads/concentrated loads. A combination of a number of skidshoes creates a flexible system to move complicated and heavy loads.

Also for smaller loads ALE Lastra can offer you a larger number/type of equipment.



❑ **Bridge launch using hydraulic skid shoe system**



❑ **Skid shoes interconnected for the movement of a large structure**



The gantry concept was developed from innovative engineering at ALE. From the very beginning ALE preferred the simplicity of the gantry to the complicated alternatives provided by conventional equipment. Our gantries are totally modular in construction and incorporate engineering that is ahead of its time. In addition to providing ease of transport and quick installation, they offer the best response to wind and the lowest incidence of unforeseen weight. The ALE gantry systems are considerably lighter and more manageable and can be adapted to fit available space, thus simplifying work and making it more fluid. They also can provide savings, through efficient equipment assignment and the ability to support loads for long periods. Versatile, reliable, and well tested, our varied range of general gantry types forms part of an interdisciplinary building mode and provides greater effectiveness and higher consistency.



At ALE we believe that technology, design and above all, ingenuity, are essential requirements if we are to stay at the forefront of our field. For this reason we have developed exclusive equipment that is the result of many years of experience and research. Each item of our integrated equipment range has been designed to complement the other items in the range, and to respond to the most complex operations with total precision, regardless of weight, size, access or environmental conditions.

On our gantries our lift systems are designed for vertical loads but these can also be used for horizontal load movements, this lifting equipment incorporates the latest mechanical hydraulic electrical and software innovations. The capacity of these strandlift units varies from 25 to 500 tonnes each and we have also developed equipment with higher capacities. By combining the strength of a number of lifting units, we can lift over 20,000 tonnes of load. More importantly, our equipment can lift and lower loads of any size and configuration with total reliability and safety.



Abnormal Load Engineering operates a range of project cranes that are utilised on projects throughout the world. The cranes are a variety of mobile and crawler cranes, this allows ALE to utilise the most appropriate type of crane for the environment that it will be working in.

The project cranes that ALE operates are as follows:-

- **MK1500, 1,500te Capacity Mobile Crane**
- **AK912, 1,200te Capacity Mobile Crane**
- **LR1800, 1,200te Capacity Crawler Crane**
- **AM Hoist 11320, 450te Capacity Crawler Crane**
- **CC2000, 300te Capacity Crawler Crane**
- **KMK8400, 400te Capacity Telescopic Crane**



❑ **LR1800 installing a 265te Coke Drum, Tx, USA**

The cranes listed are supported by the ALE fleet of trailers, ballasting and skidding systems providing clients with a seamless turnkey service on their projects.

ALE has a team of experienced multi-disciplined engineers that prepare all the method statements and rigging studies that are required for the execution of all lifting operations.

ALE's strong engineering background and worldwide network of offices offers the highest standards of lifting being practiced, no matter where the projects are located. ALE equipment is shipped regularly around the world to different projects.

ALE has recently been active in turnkey projects in Europe, North and South America, Africa, Middle East and Asia.



❑ **MK1500 installing a 350te Tower in China**



Abnormal Load Engineering is experienced in the pressures associated with Shutdown works in Petrochemical, Power and Civil plants. This experience coupled with strong engineering solutions and well-kept and maintained plant and facilities offer the client an efficient shutdown service with the minimum of risk.

ALE's engineering background has also developed solutions and control measures for lifting methods to be utilised that were previously not considered by some clients.

In a recent project in Taiwan a monitoring system was used to monitor the level of a tandem lift beam and hence minimised the risk of the lifting operation by quantifying and controlling any load transfer between the cranes. This was carried out for a client who had previously considered tandem lifts unacceptable.



❑ **Replacement of Reactors in Tunisia using AK912 during shutdown**



❑ **Tandem lift using LR1800 and MK1500 of 390te Tower in Taiwan. Tailing by AM Hoist 11320 crane**





❑ **Load-out of 10,400 Tonne Integrated Deck at Port Clarence, Middlesbrough**

ALE is one of the worlds leading contractors for the load-out of modules and jackets for the offshore fabrication industry. Over 600 structures have been loaded out by ALE since 1980.

Technical advances in offshore lifting capabilities have prompted the fabrication of complete topsides weighing in excess of 10,000 tonnes. ALE has designed and developed systems to load-out these structures using self propelled transporters.

The use of CAD and current technology has enabled ALE to develop the engineering and computer systems required to design barge ballasting and mooring systems. Stability and reaction loadings are analysed to provide optimum transporter configurations.

ALE's project managers, supervisors and technicians are highly trained and experienced. Compliance with benchmark Quality, Health, Safety and Environment standards is priority in our operations.

*Key features of transporter load-outs include:*

- **Modules can be fabricated under cover and transported hundreds of metres to the load-out quay.**
- **Several modules can be built at the fabrication facility without impeding access to the load-out quay.**
- **Multiple load-outs can be executed using a single quay.**
- **Minimum site disruption.**
- **Low ground bearing pressures minimise the need for site preparation or strengthening.**
- **Trailer configurations are always designed to meet individual parameters and constraints.**
- **The 360° computer controlled steering capability of the SPMT transporters provide maximum choice of build position.**
- **Transporter systems can be used to move major sub-assemblies around the site during construction.**

In co-ordination with a selected number of first class owners and agents, Abnormal Load Engineering offers a total 'complete solution' service when the requirement arises to transport heavy cargo overseas or just up-river.

Project cargo and/or single heavy items from, or to, the most unusual destinations in the world are performed with the greatest attention to detail, precision and on-time delivery.

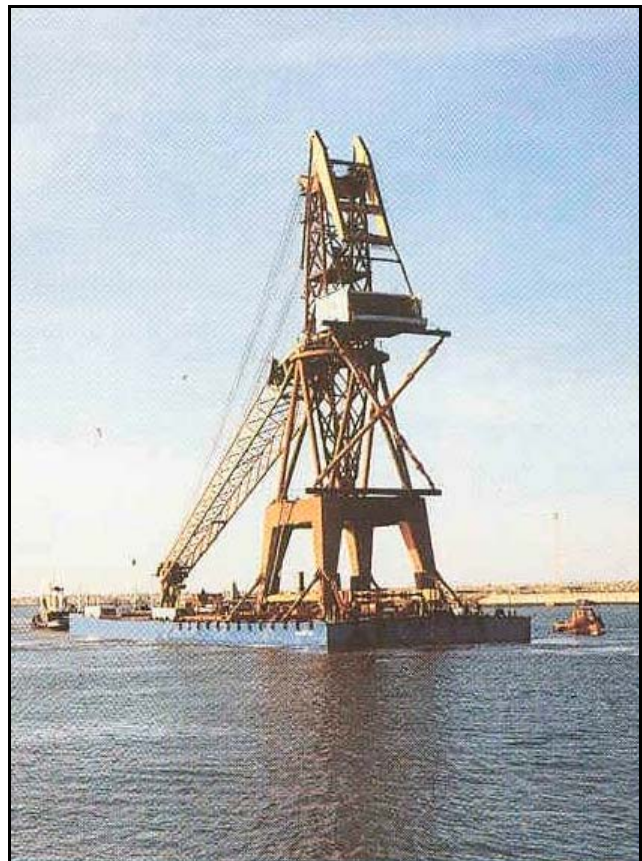
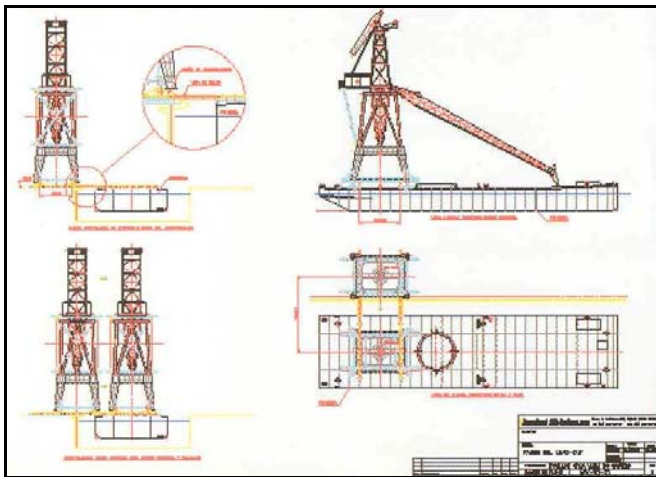


❑ **Storage Tanks – Stavanger to Fensfjord**

For barge or pontoon related operations Abnormal Load Engineering not only supply and install ballasting, mooring and ro-ro systems but each operation is engineered, planned and managed by highly skilled in-house personnel.



❑ **Loadout Operation Including Barge Ballasting & Mooring**



❑ **Loading, Sea Transport and Unloading Shipyard Cranes**





❑ **Transport of 800Te PAU to a New Gas Plant**

ALE undertakes complete turnkey transportation and installation contracts for the oil and gas, petrochemical, process plant and power generation construction industries.

The project package includes:-

- **Load out at fabrication yard**
- **Marine transportation**
- **Load in**
- **Transportation to job site**
- **Installation or erection**
- **Engineering and planning**
- **Project management**

To maximise the potential offered by this philosophy we undertake studies to determine the feasibility of modular or conventional build concepts. Studies include detailed analysis of transportation constraints between fabrication location and jobsite, on-site layout and foundation arrangements. We work with the world's heavy lift ship and barge owners to select the best method of marine transportation. Erection schemes are analysed to determine the correct heavy lift equipment for each contract. This may include ALE's own heavy lift cranes, jacking and gantry systems or other proprietary systems.

Using the right equipment, experienced project management and engineering we ensure that all work is scheduled and executed to programme and the highest health, safety and environmental standards.



❑ **Lifting Factionator Column at 266 tonnes by means of LR1800 1200 tonnes Crawler Crane**

## General

From its inception to the present day Abnormal Load Engineering has been an engineering lead company producing innovative ideas to provide solutions that meet the specific needs and requirements of our clients.

Our personnel are predominantly qualified engineers with a specialist knowledge and experience of moving and lifting heavy loads on land as well as on water. We have complemented our engineering base with commercial expertise. Our vastly experienced project management personnel are trained to look for cost effective, optimum solutions, designed to take full account of each client's particular requirements.

Our commercially practical and sound technical approach is supported by the management team and enables us to undertake comprehensive project feasibility and execution studies. If the basic evaluation and execution strategy is well thought out then the project will benefit significantly in terms of both cost and schedule.

ALE's experience and skill base is especially valuable for modular construction projects. Transportation and installation considerations have an important bearing on every aspect of the project including site layout, module design, construction sequence and choice of fabricators.

For such projects Abnormal Load Engineering can provide experienced project engineers or project managers to work 'in-house' with our client at critical times during the planning and engineering of the project to work towards optimum solutions.



## I.T.

Abnormal Load Engineering's I.T. strategy is to make the best use of the available technology so that we can support our project personnel and our clients with a professional, flexible and secure I.T. service.

Drawings, manuals and procedures are produced and stored electronically to allow the interchange of data with clients for input and to our site teams with output, changes in methodology due to unforeseen circumstances are seamlessly transmitted to the working areas.

Our policy is to be able to communicate electronically with any other system in order to effectively exchange data and manage documentation. Data access is available to all of our operating centres.

Our site engineers are provided with computer facilities, which via modem links, gives them access to review and 'red line' drawings and other documents.